RULE 246 NATURAL GAS-FIRED WATER HEATERS

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100 **GENERAL**

PURPOSE: To limit the emission of nitrogen oxides (NO_x) from natural gas-fired water 101 heaters.

102 APPLICABILITY:

- Geographic: The provisions of this rule apply to all of Placer County.
- 102.2 General: This rule shall apply to any person who manufactures, distributes, offers for sale, sells, or installs any natural gas-fired water heater with a rated heat input capacity less than 75,000 British Thermal Units per hour (BTU/hr), for use in this District.

103 **EXEMPTIONS:**

- Exemption, Large Natural Gas-Fired Water Heaters: Water heaters with a rated heat input of 75,000 BTU/hr or greater are exempt from all provisions of this rule.
- Exemption, Recreational Vehicles: Natural gas-fired water heaters used in recreational vehicles are exempt from all provisions of this rule.
- Exemption, Swimming Pools and Hot Tubs: Natural gas-fired water heaters used exclusively to heat swimming pools and hot tubs are exempt from all provisions of this rule.
- Exemption, Other Fuels: Water heaters using any fuel other than natural gas are exempt from all provisions of this rule.

200 **DEFINITIONS**

- BRITISH THERMAL UNIT: The amount of heat energy required to raise the temperature 201 of one pound of water from 59° F to 60° F at one atmosphere pressure
- 202 **HEAT INPUT:** The amount of heat energy released by natural gas burned in a natural gas-fired water heater. It is calculated during certification testing in accordance with the test method referenced in Section 502.
- 203 **HEAT OUTPUT:** The amount of heat energy, H_o, in British Thermal Units (BTU), absorbed by the water being heated during the process of natural gas-fired water heater testing in accordance with the protocol referenced in Section 502. It is calculated using the following equation:

$$H_0 = MC_{pi} (T_{del} - T_{in}) + V_{st} D_n C_{p2} (T_{max} - T_0)$$

Where: H_0 Heat output, in BTU

> М = Mass of the water withdrawn, in pounds

= Specific heat of water at the average temperature C_{pi} $[(T_{del} + T_{in})/2]$, BTU per pound per ${}^{o}F$

= Average delivery temperature, ^oF. T_{del}

= Average inlet temperature, ^oF. T_{in}

 V_{st} Storage tank capacity, in gallons, as determined in Section 212 Density of water at the average temperature $[(T_{max} + T_0)/2]$, D_n

pounds per gallon

 C_{p2} = Specific heat of water at the average temperature, [($T_{max} + T_o$)/ 2], BTU per pound per o F.

Γ_{max} = Maximum mean tank temperature recorded after cutout following the test draw, ^oF.

T_o = The maximum mean tank temperature recorded prior to the test draw, ^oF.

- **204 JOULE:** A unit of heat energy output equal to 9.4799 X 10⁻⁴ BTU.
- **MOBILE HOME:** A residential dwelling, designed and manufactured to be movable from site to site as desired by the owner/occupant, and that is not a Recreational Vehicle as defined in Section 211.
- **MOBILE HOME WATER HEATER:** A natural gas-fired water heater manufactured exclusively for mobile home use.
- **207 NANOGRAM:** A unit of mass equal to one billionth of a gram, or 10⁻⁹ gram.
- **208 NATURAL GAS:** A mixture of gaseous hydrocarbons containing at least 80 percent methane by volume as determined according to American Standard Test Method (ASTM) D1945-64.
- **NATURAL GAS-FIRED WATER HEATER:** A closed vessel in which water is heated by the combustion of natural gas and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210° F (99° C).
- 210 RATED HEAT INPUT CAPACITY: The heat input capacity specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different from the heat input capacity specified on the nameplate, the actual heat input capacity, as certified by the Manufacturer or Certified technician, shall be considered as the rated heat input capacity.
- 211 RECREATIONAL VEHICLE: A motor home, travel trailer, truck camper, or camping trailer, with or without motive power, designed for human habitation for recreational, emergency, or other occupancy, and which meets all of the following criteria: (1) contains less than 320 square feet of internal living room area, excluding built-in equipment, including, but not limited to wardrobe, closets, cabinets, kitchen units or fixtures, and bath or toilet rooms; (2) contains 400 square feet or less of gross area measured at maximum horizontal projections; (3) is built on a single chassis and (4) is either self propelled, truck mounted, or permanently towable on the highways without a permit.
- **STORAGE TANK CAPACITY:** The capacity of the natural gas-fired water heater in gallons. It is calculated using the following equation:

$$V_{st} = (W_f - W_t) / D_s$$

Where: Vst = Storage capacity of the water heater, in gallons

W_f = Weight of the water heater completely filled with water, in pounds

 W_t = Weight of the empty water heater, in pounds

D_s = Density of water at the test temperature, in pounds per gallon

SWIMMING POOLS AND HOT TUBS: (For the purposes of Section 103.4 of this rule) Residential only, single-dwelling, recreational and personal therapeutic equipment, including in-ground swimming pools, above-ground swimming pools, spas and hot tubs.

300 STANDARDS

- **NITROGEN OXIDES EMISSION LIMIT:** A person shall not distribute, offer for sale, sell or install, any natural gas-fired water heater within the District, unless it meets either of the following standards:
 - 301.1 A natural gas-fired water heater that emits less than or equal to 40 nanograms of nitrogen oxides [calculated as NO₂] per joule (93 pounds per billion BTU) of heat output; and is certified in accordance with Section 402.
 - 301.2 A mobile home natural gas-fired water heater that emits less than or equal to 50 nanograms of nitrogen oxides [calculated as NO₂] per joule (116 pounds per billion BTU) of heat output; and is certified in accordance with Section 402.

400 ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE: Effective January 1, 1998, no person shall distribute, offer for sale, sell or install any natural gas-fired water heater which does not comply with the requirements of Section 300.

402 CERTIFICATION REQUIREMENT:

402.1 A manufacturer of any natural gas-fired water heater subject to Section 300 shall submit to the Air Pollution Control Officer (APCO) at least 30 days prior to sale, a statement obtained from an independent testing laboratory, certifying that the laboratory tested the unit in accordance with the method in Section 502 of this rule, and that it is in compliance with the provisions of Section 300. The statement shall be signed and dated, and shall attest to the accuracy of all information. The statement shall include the brand name, model number, the heat input capacity rating as it appears on the water heater rating plate, and test results in accordance with Section 502;

OR

- 402.2 A manufacturer shall submit to this District an approved South Coast Air Quality Management District (SCAQMD) certification obtained from an independent testing laboratory. Any model of natural gas-fired water heater certified as complying with the SCAQMD Rule 1121 prior to July 1, 1995, need not be recertified to the test protocol specified in Section 502 until such time as required by the SCAQMD.
- 402.3 A manufacture shall submit a new certification or certification statement meeting the requirements of Section 402.1 or Section 402.2 for any natural gas-fired water heater, the design of which is changed in any manner which may alter the emissions from the water heater. New certifications or certification statements, for either altered or new models, shall be submitted to the APCO at least 30 days before the water heater is offered for sale in the District.

MANUFACTURERS' LABELING REQUIREMENT: A manufacturer shall display the model number of the water heater complying with Section 300 on the shipping carton and on the rating plate of each water heater unit. The manufacturer shall also display the certification status on the shipping carton and on the water heater. A label stating "Certified per South Coast Air Quality Management District, Rule 1121" or equivalent language, will meet the shipping carton label requirement of this section.

500 MONITORING AND RECORDS

- **RETENTION OF RECORDS:** A manufacturer shall keep test data, calculations, reports and other certification records for as long as the water heater model is offered for sale or sold in the District, or for three calendar years after manufacture, whichever is longer. These records shall be made available to the Air Pollution Control Officer upon request.
- **TEST METHOD:** Any natural gas-fired water heater distributed, offered for sale, sold, or installed within the District Shall be tested in accordance with the South Coast Air Quality Management District Protocol: "Nitrogen Oxides Emission Compliance Testing for Natural Gas-Fired Water Heaters and Small Boilers, January 1995".